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SOCIETY OF ARTS.

FRIDAY, APRIL 8th, 1853.

FIFTEENTH ORDINARY MEETING,

Wednesday, April 6th, 1853.

THE Fifteenth Ordinary Meeting of the Society was held on Wednesday, the 6th inst., Robert Stephenson, Esq., M.P., Vice-President, in the chair.

The following were elected Members :

Bladon, Thomas, Uttoxeter.
 Brown, William, M.P., Liverpool.
 Courtauld, George, Braintree, Essex, and 2, Carey-lane, Goldsmiths' Hall.
 Dickinson, Joseph, M.D., Great George-street, Liverpool.
 Eykyn, Roger, 22, Change-alley, and Streatham.
 Eykyn, Thomas, 22, Change-alley, and Bayswater.
 Houron, John Saul, Collegiate Institution, Liverpool.
 Solly, Richard, Sheffield.

The following Institutions have been taken into Union since the last meeting :

Bicester, Literary Institution and Mutual Improvement Society.
 Wirksworth, Mechanics' Institution.

A paper was read on "Recent Improvements in the Preparation and Treatment of Flax," by John Wilson, F.R.S.E., &c.

The object of the present paper having reference rather to the technical than to the original history of Flax, I will merely describe the plant so far as is necessary for my purpose, and then proceed to discuss its economic application. It is generally seen in a cultivated state growing to the height of two to two and a half feet, flowering towards the end, and arriving at maturity towards the end of the following month. It is then harvested, and consists of a thin reedy stem, surmounted by a branching head, carrying at its extremities certain small capsules or seed bolls. These are removed by means of rollers, and the stem, or straw, from which the fibre is obtained, remains. This straw consists of three parts—the centre, usually termed "shove," or "buon;" the fibre, which surrounds it; and the epidermis, or skin, which forms the exterior. Now the object desired is to separate this fibre from the other portions; and many different processes have been devised for effecting it. These may be all classed under two heads—those dependent upon mechanical principles, and those dependent upon chemical principles. In the former the operations are conducted in a dry state; in the latter, in a wet state. The most important mechanical processes are those invented by Lee, in 1812, which was favoured by a special Act of Parliament, and supported by a grant from the Irish Linen Board; by Hill and Bundy, in 1817; and more recently by Doulan, Davy, and others. The advantages of this principle are seen in the expeditious manner in which it is effected; when the crop is of a very inferior character, so as not to pay for the expense of steeping, &c., in districts where steeping is effected with difficulty, and in cases where coarse yarns only are required. On the other hand, it would appear that, owing to a large portion of the azotised substance of the plant remaining attached to the

fibre, it is not suited for fine fabrics; the elements of fermentation exist, ready to be called into action by moisture, &c.

The chemical processes are due either to the action of fermentation, which destroys the portion of the plant that binds the several parts together, and thus sets free the fibre,—to the action of heated water or steam, which simply dissolves it out,—or to the action of chemical agents, such as alkaline solutions, which effect the same end. By the fermenting process a portion of the plant is destroyed, the products of decomposition manifesting themselves in the shape of noxious and offensive gases. By the steam or hot-water processes the matter dissolved out is rendered serviceable as a feeding substance, and no annoyance is occasioned. The common practice is either to steep the flax in pools or in slowly running streams—in both, the mode of proceeding is the same; in the pool, owing probably to the increased temperature, the time required is from seven to fourteen days; in the stream, from fourteen to twenty-one days: in both cases the weather materially influencing the operation. In some districts the practice of dew-retting still exists, and this is always very irregular in its effects; in dry seasons it frequently fails. In 1846, Schenck's process of hot-water steeping was patented, and in 1848, a rettery on a considerable scale was established in Mayo. Upwards of twenty are now at work in different provinces in Ireland, besides several in this country. The principle of fermentation is the same in this as in the old process, but is now placed under the control of the operator, who regulates the action of the steep according to the quality of the flax, or the article he wishes to produce. A great saving in time is effected—from seventy-two to ninety-six hours only being required instead of from two to three weeks, and a more regular and certain fibre is obtained.

In some experiments instituted by the Irish Flax Improvement Society into the merits of the two methods of steeping, it resulted that in increased yield, Schenck's gave an advantage of twenty per cent.; that in quality, two samples of Schenck's spun respectively to seventy and one hundred and one lea yarns, while two samples of the same flax, cold steeped, only spun to sixty and ninety-six leas. The use of hot water for accelerating the fermenting process has been known for a long while past, and is mentioned in the Report of Class IV., by Professor Solly, the indefatigable Secretary to this Society. I must also refer you to the Report for the very interesting particulars connected with the application of alkaline solutions as a substitute for the tedious and noxious process of fermentation in the preparation of flax. You will there see that in 1747 the principle was made known by Lilljekreuses and Palmquist; and that in 1775, Lady Moira actually carried into practice the same process which has recently been brought before the public by Chevalier Claussen; while Gay Lussac, Berthollet, and other chemists, have added their testimony to the solvent powers both of alkaline and acid solutions. In the use of chemical agents a considerable expense is incurred, the matter dissolved out is wasted, and a chance of injury to the fibre exists. These

objections are entirely met by Watts's process, which was patented last year, and is now in active operation at Belfast, and in progress in several other localities. In this steam is the agent employed. The straw is confined in a suitable chest or chamber, steam at a certain pressure is blown in, and kept in action during from ten to twelve hours; this is condensed by a simple arrangement, and, trickling down through the mass, carries with it the soluble matter of flax, which is drawn off at the end of the operation, and is found to be well adapted for distilling purposes, having a value equal to distillers' wash.

The subsequent operations of drying, scutching, &c., are conducted in the usual manner. The importance of this new process was immediately recognised, and a Committee of Investigation appointed by the Flax Society to institute "a careful and extensive series of experiments, with a view to compare it both in a practical and financial point of view, with the modes of hot and cold steeping generally practised." The Committee made their Report on the 3rd of November last, from which it appears that the whole operation, from the straw to the dressed fibre, was completed in thirty-six hours;—that the cost of all the operations, not including the drying, for reasons stated, appeared to be under 10*l.* per ton of cleaned fibre for labour, exclusive of general expenses;—that 10*½* cwt. of straw, after being steamed for eleven hours, was reduced to 7 cwt. 0 qr. 11 lbs., which on being scutched yielded 187 lbs. of flax, 12 lbs. 6*½* ozs. of fine scutching tow, and 35 lbs. 3 ozs. of coarse tow. The samples were valued at 5*6*l. to 7*0*l. per ton. The yield on the heckles was good, and the yarns were pronounced equal in all respects to what is generally spun from flax of the finer qualities.

The Report throughout was very satisfactory. Here, then, we have a process which presents the following advantages over the ordinary methods:—1. Great saving in time; 2. Economy of fibre; 3. Avoidance of any nuisance, and economical application of waste products. No sooner had the spinners reported favourably on Watts's fibre, than another process was patented by Buchanan, which appears to be an improved application of the same principle as Watts's; as the solvent power is clearly not due to the steam, but to the hot water occasioned by its condensation. In this, the steeping is effected by repeated immersions in a bath of heated water, arrangements being made by which the temperature is never allowed to exceed a certain point. The process is quite automatic, and the mechanical means by which it is effected are very simple and very inexpensive. The flax is placed in an open vessel, having a false bottom; a boiler generates the steam required; and between these two is placed a suitable vessel, having the same capacity as the steep-vessel, and communicating by means of pipes both with that and the boiler. This centre vessel is filled with water, and steam is blown in from the boiler. When condensation no longer takes place, the hot water is driven over into the vessel in which the flax is laid, and completely immerses it. An overflow-pipe then acts upon a valve, which immediately cuts off the supply of steam from the boiler, and at the same time turns on a spurge of cold water into

the centre vessel (or condenser); the steam is at once condensed, and the liquor drawn back from the steep-vessel, into which it had been previously forced. This operation may be repeated as often as desired; as, directly the condenser is filled, the cold water is cut off, and the steam again turned on. So far as experiments on a small scale have gone, it has been found that by ten immersions all the colouring matter of the flax has been removed—these in practice on a commercial scale would not occupy longer than three hours. This, however, has yet to be seen: works on an extensive scale are now in progress in Scotland for carrying out the process. In this, the same advantages are obtained as in Watts's—great economy of time, and economy of products.

Another great improvement is claimed by Buchanan; his method of drying the steeped flax preparatory to scutching. This is usually a tedious and expensive part of the operation, the fibre always sustaining some injury from the necessary handling. He proposes to effect the desiccation in the vat in which the flax is steeped, by means of *dry* warm air, which is driven through it in large quantities. This air is obtained in the required state by passing it through *porous* earthenware pipes, fixed in the lower part of the chimney shaft. The Patentee's experiments induce him to believe that by his process the entire operation of converting the straw into dressed fibre may be effected in the working day of twelve hours, and that in all respects his products will be equally satisfactory with those obtained by Watts's process; while at the same time a great saving of manual labour, and consequent expenditure will be effected.

The statistics of flax show the important place it occupies in the economics of this country. Our requirements still considerably overbalance our powers of production, our average imports being 70,000 tons of flax, 650,000 quarters of seed for crushing and sowing, and 70,000 tons of oil-cake,—approximating in value five millions sterling; a large sum to be given annually to foreign countries for an article for the production of which our own is so peculiarly suited.

The CHAIRMAN moved a vote of thanks to Professor Wilson, for the information he had afforded on a subject which commended itself to the attention and interest of every one. He trusted that an impetus would be given to the growth of flax, especially in Ireland, so that by mutual dependence in commerce, the bonds between that country and Great Britain might be made stronger than they had hitherto been.

Mr. DAVY rose to second the vote of thanks, in which he personally, most cordially joined. As he saw on the table a case of specimens which were prepared by himself, and presented to the Commissioners of the Great Exhibition, and as his name had been mentioned in the paper just read, he wished to add one or two remarks. His name had been mentioned in connection with the dry process of preparing flax, and as the inventor of some machinery for separating the fibrous from the ligneous portions. He wished to say that this machinery had never been brought before the public. He had merely referred to it in a discussion which had been brought about by

Chevalier Claussen. One reason why he had not brought it before the public as yet, was the great discouragement to the culture of Flax, which had been occasioned by the pretensions of that gentleman, who had created hopes that had never been realized. 'In the South of Ireland, upwards of 3,000 acres had been grown on the strength of that project, and the crop had been left unpurchased, and without any means of steeping or preparing for the market. The public having been misled in that matter, he was unwilling to bring out his invention until the bad effects of Chevalier Claussen's scheme had been dissipated from the public mind. By his plan the Flax might be worked and spun with cotton machinery; but he had no wish to see Flax reduced to this position. Mr. Davy then proceeded to answer some of Professor Wilson's objections to the dry process, deprecating the idea that it merely involved the mechanical treatment of the fibre. In reference to Schenck's process—about two years ago, a gentleman, whom he knew, went to Belfast, and purchased works to carry out that plan, and he (Mr. Davy) had an opportunity of visiting those works; from what he saw he did not form a very exalted opinion of the results. There was certainly an advantage in point of time over the ordinary process of steeping, but on examining the flax after it was taken out, he found it very objectionable, on account of the decomposition, and also from its offensive smell. In regard to the success of the plan, he might add, that he had just learned from Mr. Cobden, M.P., who was a relative of the gentleman referred to, that he had entirely abandoned the works, and given the matter up as an unsuccessful project. He then referred to a defect in the samples produced by Professor Wilson, as the result of Buchanan's process,—the colour was bad; it was the same in all flax steeped in a state of straw; and he thought it arose from the fact, that it was dried before the colouring matter was thoroughly removed from the fibre, so that in point of fact the fibre was dyed.

Mr. VARLEY made some observations on the revelations of the microscope in regard to flax, and stated, that the superior strength of flax arose from the fact that its fibre was solid, not tubular. In the first stages of its growth it was, like most other fibres, tubular; but as it ripened, it gradually filled up, and became solid. Flax fibres were very fine, were firmly cemented together, and in all strong fabrics several of these fibres were suffered to remain thus united; but in the finest materials the flax was reduced to its ultimate fibre.

It was announced that at the next Meeting, on April 13th, a paper would be read by Mr. Robert Blackwood, of Kilmarnock, "On Explosions in Mines and Collieries, and the Means of Preventing them."

PHOTOGRAPHIC INSTRUMENTS.

It will be remembered by the Members of the Society, that an Exhibition of Photography was opened in the Society's Rooms at Christmas last, by which considerable interest was excited in favour of the Art, and it also gave rise to much inquiry relative to the processes and instruments employed in producing the pictures. The Council have, with a view to affording the information then sought, caused a collection of cameras and instruments to be made, which is now opened for the inspection of any of the Members or their friends who may be desirous of examining them. The cameras exhibit several new principles of

construction, intended to increase their general efficiency, portability, and cheapness. Plans for the construction of printing-frames, stereoscopes &c., are included in the collection.

COLONIAL POSTAGE.

THE following are extracts from letters and documents recently received by the Postage Association:

A Petition, of which the following is a copy, has just arrived from Trinidad. It is signed by 112 of the leading merchants and planters in the Colony:

TO THE HON. THE HOUSE OF COMMONS, ETC.
The humble Petition of the undersigned inhabitants of Trinidad

SHOWETH,—

That your Petitioners have deeply at heart the necessity of fostering in any way the ties between this Colony and the mother country.

That cheap postal communication with England, as the centre of the commercial world, would be one of the surest means of binding us together by feelings of mutual interest.

Your Petitioners therefore pray your Honourable House to consider whether it would not be advisable, in a national point of view, at once to extend the system of pre-paid Penny Postage to this and any other portion of the Empire.

Two Petitions have been received from Tobago; one addressed to the House of Lords, the other to the Commons:

The Petition of the undersigned inhabitants of the Island of Tobago

HUMBLY SHOWETH,—

That your Petitioners have deeply at heart the maintenance and extension of friendly relations between the different nations of the world, and the polity of fostering in every way the ties between Great Britain and its Colonies.

That cheap communication with Great Britain, as the centre of the commercial world, would be one of the surest means of binding together its Colonial Empire by ties of mutual interest.

That the large and increasing emigration of the population of the United Kingdom renders this time particularly appropriate for considering the subject.

Your Petitioners therefore pray your Honourable House to provide the means of improving the Foreign and Colonial Postal arrangements, and especially to consider whether it would not be advantageous, in a national point of view, at once to extend the system of uniform pre-paid Penny Postage to the whole of the Colonies and other dependencies of the British Empire.

The Petitions are signed by the Speaker of the General Assembly, by the Solicitor-General and the Deputy Colonial Secretary, by several members of the Assembly, and by a large number of proprietors, planters, and merchants.

Resolutions passed at a meeting of the Chamber of Commerce, of the city of St. John, New Brunswick, on the 26th February, 1853:

That in the opinion of the Chamber of Commerce the extension to this Colony of a cheap and uniform rate of postage, as at present established in the United Kingdom, would be of vast importance to the trade and

commerce of this province, and to the well-being and intellectual advancement of its increasing population.

And further resolved,

That the Petition to the Imperial Parliament, praying for the establishment of a uniform system of Colonial and International Postage submitted for consideration, being in accordance with the views and opinions of the Chamber of Commerce of the city of Saint John, ordered that the Chairman for the time being, and the Secretary affix their signatures to the same on behalf of the Chamber.

From Matthew H. Richey, Esq., Halifax, Nova Scotia.

When the postage Petition is ready for transmission to England I shall have it placed in the hands of His Excellency the Lieutenant Governor. It is now signed by all the Members of the Executive and Legislative Councils of this province, and of the House of Assembly, by the Bishop and Chief Justice, and by the most influential Merchants of this city. Some time since I communicated to the Secretary of the Province the fact of my appointment to act as Local Secretary here, and received from him an assurance of co-operation. I have sent in a Petition to the Legislative Council and to the House of Assembly, drawing their attention to the Association, and praying them to aid it by such means as they may devise. This petition, I am informed, was well received.

TRADE RETURNS OF IMPORTS AND EXPORTS.

EVERY one who has occasion to consult the ponderous volumes in which the yearly Returns of the Board of Trade are published, must have felt how difficult it is to remember the high numbers and large sums, which exhibit the yearly fluctuations of the different branches of our foreign and Colonial commerce; or to attempt to form any definite estimate of the relative value and importance of each special trade. This fact has recently been well pointed out by Mr. Laurie, who has shown that if in addition to the Tables of imports and exports now printed additional columns were added, showing the relation which each item bears to the whole trade, their value would be very greatly increased. For example; when it is stated that the declared value of British produce and manufactures exported to our Colonies in South Africa, in 1851, amounted to seven hundred and fifty-two thousand three hundred and ninety-three pounds sterling,—the whole value of our exports that year being seventy-four millions four hundred and forty-eight thousand seven hundred and twenty-two pounds—it is difficult at once to see the relative importance of the South African export trade; if, however, numbers are added, showing that this particular trade constitutes one per cent. of the whole export trade of the country, its real value is much more apparent. The use of thus reducing trade returns to a decimal system is more particularly evident when we endeavour to compare together the imports or exports of one year with those of another; we then see the value of having a fixed standard of unity, namely, the whole actual commerce of the country, all special returns being reduced to per centages on that standard. It is plain that merely to state the number of tons of any article imported from a particular country does not nearly so well show its value as an article of trade, as it does if we show the ratio which that single import bears

to the whole trade of the country; and that we can best judge of the increase or decrease of value in any import, by comparing together the ratio which it bears to the whole trade of one year with that of another. It sometimes happens that the importation of a particular article seems to be increasing, when its real importance is in fact rather on the decrease; because, though it is true that the absolute quantity of it has somewhat increased, yet that increase has been less than the increased import of many other articles employed for similar purposes,—in fact, less than the general increase of that particular branch of trade. The following Table, drawn up by Mr. Laurie, will serve to illustrate the mode in which the present Government Returns may at once be simplified, and rendered more practically useful than they are at present:

BOARD OF TRADE RETURN OF EXPORTS FOR 1851.

Countries to which exported.	Declared value.	Value per cent., being the proportion which the different coun- tries bear to each other per every £100 exported.				
		£	Dec. £	£	s.	d.
1. United States	14,362,976	...19 292	...19	5	10	
2. British India	7,806,596	...10 486	...10	9	8	
3. Hanseatic Towns	6,920,078	...9 295	...9	5	10	
4. British North America	3,813,707	...5 123	...5	2	5	
5. Holland	3,542,673	...4 759	...4	15	2	
6. Brazil	3,518,684	...4 726	...4	14	6	
7. Australia	2,807,356	...3 771	...3	15	5	
8. Turkey, &c.	2,221,359	...2 984	...2	19	8	
9. British West Indies	2,201,632	...2 956	...2	19	1	
10. China	2,161,268	...2 903	...2	18	0	
11. France	2,028,463	...2 725	...2	14	6	
12. Foreign West Indies	1,850,210	...2 485	...2	9	8	
13. Russia	1,289,704	...1 732	...1	14	7	
14. Naples and Sicily	1,266,211	...1 722	...1	14	0	
15. Peru	1,208,253	...1 623	...1	12	5	
16. Chili	1,181,837	...1 587	...1	11	9	
17. Portugal, &c.	1,149,932	...1 544	...1	10	10	
18. Spain, &c.	1,065,320	...1 431	...1	8	7	
19. Belgium	984,501	...1 322	...1	6	5	
20. Egypt	968,729	...1 301	...1	6	0	
21. Islands in the Indian Seas	962,593	...1 293	...1	5	10	
22. Tuscany	896,131	...1 167	...1	3	4	
23. Austrian Italy	812,942	...1 092	...1	1	10	
24. British South Africa	752,393	...1 011	...1	0	2	
25. Sardinia	706,108	...948	...0	18	11	
26. West Coast of Africa	658,934	...885	...0	17	8	
27. Channel Islands	613,724	...824	...0	16	5	
28. Mexico	577,901	...776	...0	15	6	
29. Prussia	503,531	...676	...0	13	6	
30. Gibraltar	481,286	...646	...0	12	11	
31. Buenos Ayres	458,320	...616	...0	12	3	
32. Sweden and Norway	447,133	...601	...0	12	0	
33. Denmark	445,500	...598	...0	11	11	
34. Syria and Palestine	359,871	...485	...0	9	8	
35. Venezuela	349,701	...470	...0	9	4	
36. New Granada	319,889	...430	...0	8	7	
37. Central America	319,814	...430	...0	8	7	
38. Malta	301,443	...405	...0	8	1	
39. Papal territories	266,633	...358	...0	7	2	
40. Hayti	239,146	...321	...0	6	5	
41. Mauritius	232,955	...313	...0	6	3	
42. Honduras	232,633	...312	...0	6	3	
43. Hanover	227,288	...305	...0	6	1	
44. Ionian Islands	223,096	...300	...0	6	0	
45. Greece	220,592	...296	...0	5	11	
46. Uruguay	218,078	...293	...0	5	10	
47. South Sea Islands	60,795	...082	...0	1	7	
48. Ecuador	54,099	...073	...0	1	5	
49. Morocco	40,783	...055	...0	1	1	
50. Mecklenberg Schwaben	33,153	...045	...0	0	10	
51. Ascension and St. Helena	30,555	...041	...0	0	9	
52. Bolivia	20,100	...027	...0	0	6	
53. Aden	17,184	...023	...0	0	5	
54. Cape de Verd Islands	11,094	...015	...0	0	3	
55. Oldenburg	10,009	...013	...0	0	3	
56. Tunis	7,549	...010	...0	0	2	
57. Algeria	6,917	...009	...0	0	2	
58. Falkland Islands	2,841	...004	...0	0	1	
59. Dutch Guiana	2,139	...003	...0	0	0	
60. Ports of the Red Sea	788	...001	...0	0	0	
61. Pondicherry	443	...001	...0	0	0	
62. Greenland	282	—	—	—	—	
63. Heligoland	238	—	—	—	—	
64. Eastern Coast of Africa	224	—	—	—	—	

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SUGAR PRODUCE.

The following valuable Table of the quantities of sugar annually produced in different parts of the world, is extracted from a series of similar useful statistical returns, recently published by Dr. E. Stolle, of Berlin:

1. CANE SUGAR.			
I. In the English Colonies:			
	Cwts.	Cwts.	
The Antilles	3,060,000		
Mauritius	1,000,000		
East Indics and Ceylon	2,970,000		
		7,030,000	
II. In the Spanish Colonies:			
Cuba	5,000,000		
Porto Rico	1,000,000		
The Phillipines	500,000		
Andalusia	150,000		
		6,650,000	
III. Brazil		4,000,000	
IV. The United States:			
Louisiana	2,624,860		
Texas	70,170		
Florida	17,410		
Georgia	12,730		
Mississippi	2,780		
South Carolina	1,500		
Alabama	280		
		2,729,730	
V. Dutch Colonies:			
Java	1,000,000		
Surinam	300,000		
		1,300,000	
VI. French Colonies:			
Martinique	468,134		
Guadaloupe	400,928		
Bourbon	417,868		
Guyana	6,410		
		1,293,340	
VII. Danish Colonies:			
St. Croix and St. Thomas	150,000		
Total Cane Sugar Exported	23,153,070		
N.B.—To this must be added the quantity consumed in the various countries, which must be nearly equal in amount to that given above.			
2. BEET-ROOT SUGAR.			
	Factories.	Cwts.	Cwts.
I. France	333	1,327,221	
II. Zollverein	237	1,219,320	
III. Russia	360	300,000	
IV. Austria	171	240,000	
V. Belgium	40	142,876	
VI. Poland	42	60,000	
VII. Great Britain	2	7,000	
		3,296,417	
	1,185		
3. PALM SUGAR.			
Hindostan; Siam, Sumatra, Java, etc.	2,000,000		
4. MAPLE SUGAR.		Cwts.	
1. United States—			
New York		100,481	
Ohio		63,634	
Vermont		46,479	
Indiana		37,278	
Pennsylvania		22,658	
New Hampshire		11,624	
Virginia		15,418	
Kentucky		13,778	
Michigan		13,298	
The other States		20,309	
2. Canada		60,000	
Total Maple Sugar		404,957	

HOME CORRESPONDENCE.

DUTY ON PAPER.

SIR,—Although not so important as those previously mentioned, another very interesting branch of manufacture, much injured by the duty on paper, is that of the pasteboard maker.

A very large manufacture of pasteboard boxes has arisen in France, employing some thousands of hands, and, not being a laborious occupation, is well suited for females. If this manufacture could be established on a better footing in this country, an extensive field would be opened to the industry of poor females, whose opportunities for earning a livelihood are at present so very circumscribed. Protection in this case is all on the wrong side—we protect the foreigner against ourselves. Imported pasteboard boxes, filled with gloves or fruit, pay no duty whatever as boxes; when imported empty, they pay an *ad valorem* duty of 10 per cent. In this country, such boxes must be made of duty paid materials; and, on the average, 35 per cent. of the value of the pasteboard is not too high an estimate of the sum so paid. It is the opinion of those engaged in the business that a great impetus would be given to the trade by the removal of the duty; at present, they are excluded from large spheres of operation by its existence, particularly where strong material is required, thin wood board being now used and pasted over with paper, the duty on the extra weight of paper necessary to give equal strength amounting to a prohibition of its use.

A slight attention to the shackles with which this manufacture is encumbered will convince every one that very little hope can be entertained of any decided progress until the duty is removed. If the pasteboard-maker be the manufacturer of the paper, he is subject to the same regulations as paper-makers, with a few additional observances. If he does not make the paper, he is required to give twenty-four hours' notice of his intention to receive paper for pasting, must weigh, in the presence of an officer, all the paper he receives, pack in prescribed quantities, affix labels, of which valuable documents he must not lose one under a penalty of 100*l.*, give twenty-four hours' notice to charge, and keep the goods, after charged, twenty-four hours, in order that time may be afforded for the visit of a superior officer, who then re-weighs the articles. Thus, the unfortunate pasteboard-maker has to do what, I believe, is unparalleled in any nation—weigh the same goods three times over for revenue purposes, the paper having been previously weighed and duty charged at the paper-mill. By far the larger quantity of pasteboards made undergo three, four, and often five weighings for one payment of duty. The paper is weighed, and the duty charged, by a subordinate, and then re-weighed by a superior officer at the paper-mill; weighed, in the presence of an officer, into the stock of the pasteboard-maker; weighed by an inferior, after pasted, and re-weighed by a superior officer as a check. It then probably goes into the possession of an exporter, where it is again weighed that the duty may be returned. To what purpose are all these weighings at a pasteboard factory—to raise a revenue on paper? No, that has been already done at the paper-mill; but to raise a charge on the paste used, as we find officers are required “to deduct the weight of the paper opened from the weight of the pasteboard charged, the *excess* in the latter being the charge against the trader.” The spirit in which officers are expected to perform this part of their duty, is evident from the injunction on

them "to enforce a strict compliance with all the legal regulations on the part of pasteboard-makers," a breach of regulation being as much a revenue sin as defrauding the duty.* After all this, it may be thought no ounce of paste used can escape taxation. Curiously enough, by some mysterious manipulation, very little, at least in London, of the paste used pays duty. The whole affair would be ridiculous, if it were not so great a nuisance.

Paper-stainers.—It is not with the higher class, so much as with the lower description of stained paper, that the duty materially interferes:

"The whitewash'd wall, the nicely-sanded floor,"

are more agreeable in poetry than comfortable in reality. From some little acquaintance with humble town and rural life in England and elsewhere, I am led to conclude that the lower classes have no more innate liking for bare walls than the wealthier. Motives of economy frequently induce a preference for the poorest patterns, as expense must necessarily be incurred in obtaining good designs, and the paper-stainer must consequently increase his price. The duty of 30 per cent. on the paper used, if devoted to improvement in the design and execution, would, I conceive, conduce very materially to the Art Education of the people.

That the eye of the most uneducated is not satisfied with a bare wall, is proved from the attempts to relieve the monotony by the extensive purchases of common pictures from hawkers. A quiet, unobtrusive, well-designed paper, not distracting by its glaring colours, but giving repose to the wearied eye, and relieving the more prominent paintings, furniture, and decorations, is a great element of domestic comfort.

The modes, direct and indirect, in which the public would be beneficially affected by a repeal of the duty, are various. Direct benefit would immediately ensue to those who use the coarser description of paper for packing,—as Manchester warehousemen, grocers, hardware manufacturers and dealers. The duty being a very high per centage of the value of this paper, the price would be considerably reduced. Exporters who now frequently experience great inconvenience and loss of time from the forms required to be observed to secure the drawback, would also receive direct benefit. The inconveniences attending the recovery of the drawback can only be known by experience. The necessity of an officer's signature to paper before being cut into letter size—the notice to pack, the weighing, the bond, the attendance of a surety, however trifling the sum to be recovered,—all occupy much time, and sometimes occasion great inconvenience. As an instance, I may mention that within the last few days an Australian buyer, whose time in England being limited, is therefore of great importance to him, remarked on this subject, that the drawback system was a great hindrance to business;—having a large quantity of goods, the packing of which he desired to superintend himself, he had given the usual notice to pack, and had waited the whole of the day, no officer attending; so, notwithstanding his other urgent business, he was compelled to lose the day, not being able to leave, fearing the officer might arrive during his absence. This can scarcely be avoided occasionally, the number of export officers being very limited, and the export trade, of course, variable.

* The intelligence which draws up the regulations to which manufacturers are subject, is displayed in the following information, officially communicated by the Board of Excise to its officers:—"Rags are bleached by the addition of muriatic acid, which is a *chemical mixture* of salt, manganese, and oil of vitriol, prepared for the purpose;" and "inferior kinds of writing-paper are merely sized with alum." Chemists and paper-makers have yet to learn something, if these statements are true.

In many cases it is preferred to ship the goods without obtaining the drawback, to avoid the chance of delay, particularly when the packages are required to be sent by the mail steamers. These interferences with business, although not very serious in any given instance, yet from their daily occurrence in the numerous small shipments, which make up the total value of paper exported, form an aggregate of no small amount. I could give many instances, if regard for your space did not prevent.

The indirect benefits which would accrue to the public were adverted to in the remarks on Newspapers, Books, and Periodicals, and must be patent to every one. Desirous of having all the Taxes on Knowledge removed, yet mindful of the boy in the fable, who could not withdraw his hand from the jar (was this an Exchequer?), because he grasped too much, I have strictly confined myself to the operation of the Duty on Paper; and sincerely trust that as we have removed the tax on corn—conferring much benefit on the bodies of the people—removed the tax on bricks and glass, greatly to the advantage of our habitations—so we may not be altogether regardless of the superior part of our being, and without delay remove the impediments which prevent the realization of that ideal of humanity—"A sound mind in a healthy body." On the eve of some general scheme of education, I cannot but think it would give much greater confidence in the real interest Government is thought to take in the question, if they would preface their proposal by a Repeal of the Paper Duty, if more cannot at present be afforded. Their proposition would be well ushered in by the announcement—"We will remove all obstacles to the self-education of the people; they shall be the workers and the builders; we the architects, and the directing minds only." The Intellect Ministry might then justly have some claim to our esteem, and write for itself a brilliant page in the Nation's history.

Regretting I should have occupied so much of your space, and hoping some of the remarks may not have been altogether inappropriate,

I remain, yours, &c.

WAIMA.

ON THE BEST MODE OF FOCUSING THE PHOTOGRAPHIC APPARATUS.

SIR,—Not having the honour to belong to the Photographic Society, I have only just heard that one of its members proposed at one of the meetings some time ago, a new mode of focusing the instrument in order to obtain a broader effect in portraiture, or when artists make use of Photography for sketches, and studies for compositions of figures, &c.

Upon inquiry, I have found that the mode consists in endeavouring to place the object a little out of focus, instead of endeavouring to focus as correctly as possible.

The author of this suggestion being one of our most eminent miniature painters, and at the same time an experienced amateur in photography, his opinion deserves to be examined, and his views perfectly understood. I must own, that as a photographer, I was not a little startled at the announcement of this idea; but coming from such an artist as Sir William Newton, I would not pass a judgment without mature reflection; and I now wish to discuss the question, in order to discover if the means recommended by Sir William will fulfil the object he is aiming at, and if there are not some better means to arrive at the same result.

About eight years ago, when I began to adopt the practice of taking non-inverted portraits, I observed that I always obtained a more artistic effect when the

image had been reflected by a prism, before being refracted in the camera obscura, than when I operated without a prism, and produced inverted portraits. Comparing the two different results with Mr. Talbot, that gentleman observed, that the pictures taken with the addition of the prism were softer and more harmonious than those taken without the prism; and in trying to explain the cause of the effect, we came to the conclusion, that the slight imperfection inseparable from the use of the best glass prism of a considerable thickness, which did not refract the rays in a mathematical regularity, but with a certain degree of confusion, owing to the want of the matter in all the parts of the prism being perfectly homogeneous, and that the softness of effect was produced by the rays slightly overlapping each other where they ought to be separated.

I was struck with this fact, and I began a series of experiments on the subject. I placed before the plate in the camera a very finely-ground glass, and I found that the sharp image of a well-focused, first-rate object glass, was by that means considerably softened, and the effect very artistic. Some time after, mentioning this experiment to Sir David Brewster, that eminent philosopher told me that he himself had found a great advantage in the production of positive Talbotype pictures, by placing between the negative and the positive a very thin sheet of tissue-paper.

If I rightly understand the idea of Sir William Newton, these results are exactly those which he wishes to obtain in endeavouring to operate a little out of focus; and I can well understand why a real artist is desirous of avoiding that too minute correctness of details in a photographic portrait,—a composition produced by a perfect lens at its exact focus. But there is a means to produce a better effect than by putting the image out of focus, namely, by the interposition of a slightly opaque medium; and the following are the reasons for the preference.

If it were possible to have all the various planes of the subject, or composition at the exact focus, a small error in that focus would be the same for all the various planes of the picture, and that error obtained on purpose might soften the harshness of detail, and produce on the whole a more artistic effect. But it is not so; there is only one plane for which we can get an exact focus; all the others are out of focus, and the more so as they are farther before or behind that plane. So that if the eyes are in the exact focus, the ears and the nose are out of focus, but not in a very conspicuous degree. If the body is turned on one side, and the shoulder or arm which is nearer the apparatus are in the exact focus, the other shoulder and arm are devoid of the same sharpness of outline; and when the shoulder and arm, the more distant from the apparatus, are in good focus, the front part of the body is not so sharp. In fact, the rays converging on one point, by crossing each other, form two opposite angles, the apices of both being on the point of convergence, and from that point the rays converging more and more, the confusion increases the more the objects are put out of focus.

It is, therefore, very clear that if we focus on the most important part of the subject, such as the face, and then push the tube of the lens in or out in the slightest degree, we have the means of softening the harshness of details of a too well defined face; but if we push the tube out, the parts before the face will be more confused than they were before; and if, on the other hand, we push it in, the parts behind will be more confused than they were before. The difference will be incongruous in both cases, either for the nearer or for the more dis-

tant parts. The confusion in these parts will be such that the drawing will be false, and the outline deficient.

Therefore, as it is not possible to put all the parts of the picture out of focus in the same degree, and as by the interposition of a slightly opaque medium we may have the same degree of softening effect upon the whole picture, it is preferable, in order to produce the artistic result aimed at by Sir William Newton, to focus the apparatus as correctly as possible for the middle plane of the picture, and to operate through such a medium as I have mentioned.

This subject is as important as Sir William asserts, and if examined carefully, some good may result from the inquiries. The idea is quite rational in its object; but I think that in considering the defects of altering the focus, he will find that it is inconsistent with the scientific considerations of the laws of optics, and for that reason impracticable.

I am, Sir, your obedient Servant,
A. CLAUDET.

RAILWAY ACCIDENTS.

COMMUNICATION BETWEEN GUARD AND DRIVER.

SIR,—Your correspondent "Inquirer" makes out a very elaborate statement of objections to the plan proposed by the Committee of Managers of the Railway Clearing House; but he appears to assume that it is absolutely indispensable to the carrying out of that plan, that the line or cord of communication should be continuous, and in one piece. If he had thought a little more on the subject, he would have discovered that it was quite consistent with the plan proposed, that the line might be in separate and detached pieces, each piece being rather longer than the carriage—that is to say, about as long as the distance between the faces of the buffers when "hard up"—and terminated at each end by an ordinary swivel hook. If a line of this kind was attached to every carriage in some uniform position, there would be no difficulty in attaching to, or detaching from, the train, any number of carriages that might be desirable, and with scarcely an appreciable increase of time over the present system. This too, I think, disposes of "Inquirer's" remarks as to the balance weight; and for the material of the line, I believe the Committee did not definitely settle what this should be, any more than they did all the minute details of the plan recommended by them. They simply advised the adoption of a certain system, as being of all those brought before them, the most likely to meet with general success; leaving it to each engineer, railway manager, or other official, to make such modifications in, deductions from, or additions to the plan suggested as experience might dictate, and the peculiar circumstances of each case appear to render necessary. They clearly guarded themselves against the idea that they wished to impose upon the public, or their professional brethren, a universal remedy for every ill, but expressly, and as it humbly appears to me, very wisely, left it to the discretion of the parties concerned to make such alterations as to them seemed advisable to meet any particular case. Yours, &c.

HARD-UP.

THE TORSION COMMUNICATING SIGNAL FOR RAILWAY TRAINS.

Leeds, March 28th, 1853.

SIR,—As the means for communicating between the guard and the driver of a railway train are engaging the attention of the public just now, will you permit me to describe a contrivance I have invented for this purpose,

which consists in bringing into action the only description of independent motion which cannot be interfered with by any of the various irregular movements to which such trains are liable, viz., torsional or revolving motion at right angles to the progress of the train. All the various modifications of the *tension* or bell-pull principle of communicating signals are subject to one common defect—that of the actuating force being in the same direction as the motions to which the train itself is subject. Hence, occasional contractions or elongations in a railway train—which take place to a greater or less degree according to its extent, sometimes to the amount of many yards—produce either a corresponding accumulation of slack line, which must be gathered up in some way before the signal can be acted upon; or, from sudden expansion in the train's length, cause such a strain upon the communicating line, that, unless the whistle or other signal be loaded with a resisting power sufficient to counteract it, it may be acted upon by back friction, and a false signal given. Such a resisting power in the signal must necessarily be a great hindrance to its free and effective working. A torsional transmission of motion, on the other hand, having nothing in common with any of the ordinary motions of the train, is not liable to be affected by these motions; and no resistance to the free operation of the signal is necessary. Neither is the torsional principle altogether new, as applied to railway carriages; it is, in fact, already in use upon every railway in the kingdom, in the transmission of power from the guard's winch-handle to the brake beneath. And in case it should be hereafter deemed advisable to concede to passengers themselves, under due restrictions, a power of actuating a danger signal in cases of emergency, the torsional principle would afford peculiar facilities and guarantees in so doing.

In this invention a tube extends along the under frame of each carriage, and is free to revolve in its collars or bearings. Within each tube there are plungers, with free sliding motion, similar to buffer rods, except that the plunger is prevented from revolving independently of its tube, by the insertion of a screw plug into a longitudinal slot or groove. At the extremity of each plunger is inserted a Hooke's universal joint, which not only permits the end of the plunger to hang down out of the way when not in connection with another carriage, but also permits the torsion-rod to accommodate itself, when in connection, to every possible irregularity of motion: so much so, that even if the train were to assume the form of the letter S, the torsional transmission would not be interrupted.

The apparatus can be so coupled as to form one continuous bar,—capable of yielding to, and of absorbing every motion, save and except *torsional* motion, which alone will be transmitted unchanged; two sliding ferules clasp the splice together, and the protruding pegs serve not only to render the splice immovable, but also prevent the ferules from sliding off. The peculiarity of this coupling is, that while it is very readily put together and detached, its two parts resemble each other exactly, so that either end of a carriage, indifferently, may be presented to, and coupled with, either end of its neighbour.

The chain, barrel, and winch-handle, are introduced to show in what manner the torsion-bar may be acted upon from the interior of the guard's van. Of course the same effect might be produced by what are called bevel wheels, but the plan represented is simpler and cheaper.

Yours, &c.,

ANDREW EDMUND BRAE.

PROCEEDINGS OF INSTITUTIONS.

BASINGSTOKE.—The Twelfth Annual Meeting of the members of the Mechanics' Institution took place on Thursday evening; the chair was occupied by the Mayor (C. Simmons, Esq.), one of the Vice-presidents. The honorary secretary, Mr. F. W. Bushell, read a very satisfactory report of the financial position and general proceedings of the Institution for the past year, which showed a balance in hand, after discharging all liabilities, of 58*l.* 14*s.* 7*d.*,—being 6*l.* more than last year. The number of members is, at present, 186. The library consists of 1,319 volumes, of which 26 have been presented and 49 purchased since the last meeting. During the year, 3,056 volumes have been issued. The Reading-room is also extensively used by the members, and it is gratifying to find by the report that the Music and Discussion classes still maintain their efficiency, and that another class has recently been established for the study of mathematics. The thanks of the meeting were unanimously voted to the President, Vice-presidents, Treasurer, and Secretary, and the same gentlemen were re-elected for the year ensuing. The cordial thanks of the meeting were also awarded to the members of the retiring Committee, seventeen of whom were re-elected, and in addition Messrs. Elford, Attwood, Bramsley, J. Moody, Williams, Garry, and Alderman Hulbert. Some steps are about to be taken for establishing a "Building Fund," in connection with the Institution.

On Thursday evening a Lecture was delivered on "Political Economy," by Mr. George K. Rickards. The lecturer explained that it was the duty as well as the interest of both rulers and people to study and make themselves thoroughly acquainted with so useful a science, the practical and beneficial operations of which, when properly understood and justly acted upon, were proved, by recent experience, to promote very essentially the prosperity and progressive happiness of all classes of society.

CARLISLE.—On Tuesday evening last, T. T. Relton, Esq., delivered the last of a series of Lectures in the Mechanics' Institution, on "Nineveh; its Antiquities and recent Discoveries." The Lecture was illustrated by a number of diagrams, the gift of G. Moore, Esq., of London, to the Institution, which, combined with the ability of the Lecturer, rendered the Lecture both interesting and instructive.

EDINBURGH.—On Friday evening, the session of the Philosophical Institution was closed, by an address from the Lord Advocate. The attendance was unusually numerous, and comprised many of the Directors of the Institution. The Lord Advocate, after a few introductory remarks, in which he stated that his theme would be the social position of our country at the present day, proceeded to take a review of the past hundred years. At that period, the republic of the West was a subservient and not very productive colony; the East India Company had but acquired their factory at Madras; the continent of Australia was all but undiscovered, Johnson sat on his autocratic throne; the powers of the steam-engine were unknown; the debates in Parliament were reported as the proceedings of the political club; and the capital of Scotland, the court of the Pretender, in Holyrood, and the victory of Prestonpans, were topics of recent memory. The previous age, from the Revolution downwards, had been one of brilliancy and force. The period which intervened between that stage and the next,

in 1793, was the golden age of parliamentary eloquence and of mental philosophy. But if England at that day, cold and lifeless as she was in the aspirations of genius, gave to liberty the noblest specimens of free discussion that were ever laid on her altar, the Scotch philosophers of the nineteenth century were quite as remarkable as the English orators. As the great orators fell one by one, and mental philosophy lost its charm to please, there succeeded a band of minstrels, a chorus of song, more than worthy of the age of Elizabeth. We have now reached another stage. The orators gave way to the poets, and now the poets themselves become gradually mute, and no one takes up their song. But about the end of that period came that sudden development of the mechanical mind of Europe which, in the space of thirty years, had inverted the relations of time and space ; altered, so to speak, the magnitude of the globe ; and changed the very face of Nature herself, as regards man's interest in, and power over it. It seemed to him that steam machinery, steam navigation, railway travelling, and the electric telegraph, had given the world an impulse which almost nothing short of a convulsion of Nature could again retard. About 1820, too, the banner of education was unfurled. Then, for the first time, society condescended to think for the working man ; and then commenced, amid many obstructions and great discouragements, that war with ignorance which had since gained so many victories, and was destined, he trusted, to gain many more.

EXETER.—The following Report of the Council of the Western Literary and Scientific Union to the Associated Institutions, has just been published :—The Council elected at the last Annual General Meeting of Delegates, beg to report the following results of the Premiums offered for Essays :—The Premium of 5*l.*, offered by the Union, for the best Essay, under the title “Ancient and Modern Civilization Compared,” has been awarded by the judges (Lord Courtenay and Sir Stafford H. Northcote, Bart), to the Rev. Micaiah Hill, of Kingsbridge. The Premium of 5*l.*, offered by John Sillifant, Esq., President of the Union, for the best Essay on “The Effects of Railways on the Physical, Moral, and Social Condition of the Districts within their range,” has been awarded to Mr. W. H. Geachias, of Exeter, by the judges, John Sillifant, Esq., and G. S. Curtis, Esq. The Premium of 5*l.*, offered by John Morth Woolcombe, Esq., for the best Essay on “The Antagonism of Nature, exhibited in the conflict between the Weeds and Useful Products of the Earth,” has been awarded by the judges (J. H. Hippsley, Esq., and William Miles, Esq.), to Mr. Barnett Blake, late editor of the *Exeter Gazette*. It is probably well known to the majority of the western Institutions that the Society of Arts in London has taken into consideration the propriety of connecting with itself the Literary and Scientific Societies and Mechanics' Institutes of all parts of the United Kingdom, on a plan and with objects very similar to those of this Union. The execution of this design was resolved on at a conference in London, between the Society of Arts and the Delegates from about 140 of the country Institutions. This Union was represented at the Conference by its President. A very general appreciation was evinced of the advantages of thus associating the provincial societies, many of which have already secured to themselves the benefits to be derived from the arrangement. The testimony, thus borne by so important a body as the Society of Arts, to the soundness of the principles which led to the establishment of this Union, has been observed by the Council with deep interest and satis-

faction. With the desire, therefore, of ascertaining in what manner these principles may be best promoted and extended, the Council have attentively considered this important movement, and have resolved to make the following recommendation on the course to be pursued by this Union. It appears to the Council that the Society of Arts, from its metropolitan position, possesses facilities for accomplishing the objects desired, with greater success than any provincial union could expect to achieve ; and that if the two bodies were to attempt to conduct similar operations in the same locality, they would not improbably impede each other, and thus prejudice the cause they are mutually seeking to advance. The Council therefore conceive that the best interests of the allied Institutions will be consulted by leaving the field clear for the free prosecution of the plans of the Society of Arts ; and they recommend accordingly, that, relinquishing whatever may be the advantages of a Provincial Union, the Institutions of which it is composed should transfer themselves to, and merge themselves in, the great Metropolitan Union founded by the Society of Arts. In considering to what extent the Union has fulfilled the intentions of its founders during the period of its existence, the Council believe that no slight ground of satisfaction will be afforded by the retrospect. Although complete success may not have been attained in the working details of the lecture department, yet it may be safely asserted that the collateral benefits of the Union have been widely diffused, and that they have been more especially felt by the smaller Institutions. There can be little doubt that it has had the effect of increasing the public interest in favour of Literary Institutions, in multiplying their numbers, in extending a knowledge of their advantages, and in promoting a warmer sympathy and better understanding between the members of the various societies ; an interest and a sympathy which, it is hoped, will long survive the Union itself.

JOHN SILLIFANT, *President.*

ROBERT DYMOND, JUN. } *Hon. Secs.*
R. C. HALSE,

Exeter, March, 1853.

GREENOCK.—The Twelfth Annual Report of the Mechanics' Institution states that the course of Lectures during the past session has been eminently successful, which has afforded evidence to the Committee that their efforts in this direction are duly appreciated. Both the Library and Reading-room are well supported ; to the former there have been numerous donations, while to the latter has been added a small library of reference. By a reference to the Treasurer's abstract statement it is observed that there has been a gradual reduction of the debt on the Institution ; and the Committee impress upon the members the necessity of continuous efforts to remove this burden, which materially impedes the successful working and usefulness of the Institution.

NEWPORT.—On Tuesday, the 29th ult., the Committee of the Athenaeum held an Exhibition and *Conversations* in the Town Hall. Among the objects exhibited in action, were a printing-press, a lithographic press, and an apparatus for cooking with gas. There was also a numerous collection of paintings, pieces of sculpture, bronzes, and castings ; the latter, belonging to the Coalbrookdale Company, were obtained by Mr. W. M. Jack, one of the Secretaries. In the evening addresses were delivered by the President (H. J. Davis, Esq.), the Rev. E. Hawkins, and the Rev. J. Barfield. The entertainments were closed with a concert.

PENZANCE.—Mr. W. H. Rodd, one of the Secretaries of the Institute, lately brought under the notice of the

Town Council, the importance of endeavouring to secure the local establishment of an Elementary Drawing School. A committee of inquiry was appointed, which has reported on the information received; and it is believed that very shortly the necessary requirements will be obtained, prior to making application to the Department of Practical Art for a master, and other aid.

THAME.—On Tuesday, the 22nd March, Mr Hughes, delivered his lecture on "Earthquakes and Volcanoes," to the members and friends of the Mutual Improvement Society. This being the first lecture arranged through the medium of the Society of Arts, it is gratifying to have to report that the attendance was as large as could possibly be expected, and that the interest of the audience was sustained throughout.

YARMOUTH.—On Thursday evening, the Eighth Anniversary of the Young Men's Institute was celebrated at the Town-hall, by an exhibition of works of art; by addresses by the President, Sir E. H. K. Lacon, Bart., M.P.; T. G. Hake, Esq., M.D.; and William Heane, Esq.; and by a vocal and instrumental Concert. About 500 tickets were issued. The Assembly-room was quite filled with works of art, paintings, statuettes, models, and curiosities, contributed by friends and members of the Institute. All the arrangements were highly creditable to the Society; and the room, when lighted up, presented a pleasing appearance. A dais was erected for the President, Vice-presidents, and their ladies; and near it was a statue intended to represent "Juventa," the Goddess of Youth, advocating the objects of the Institute. Tables were placed on each side of the room, and on them were displayed a great variety of curiosities. The President addressed the meeting on the great advantages that must accrue to his native town by an Institution like the present being in a hopeful and prosperous condition. It supplied young men with the means of spending those evenings profitably which would probably be spent, in too many instances, in an unprofitable manner; it tended to exalt and improve their literary tastes and habits of thought, and was, in every sense of the word, entitled to their patronage and support. He was glad to find, from the official Report, that during the past year the numbers had steadily and satisfactorily increased. The Mayor (S. C. Marsh, Esq.) congratulated the Society upon its success, and hoped that it would increase in numbers, stability, and general prosperity. Dr. Hake and Mr. W. Heane (both of Bury St. Edmunds) delivered Lectures, which were numerously attended.

TO CORRESPONDENTS.

Notice.—Members, and others, who can furnish or obtain original information or suggestions on the subjects included in the Society's Premium-list, or other topics connected with the Society's various departments of operation, are invited to communicate the same to the Secretary, in as condensed a form as possible, for the purpose of being either read and discussed at the evening meetings, or inserted in the Society's weekly Journal. Anonymous letters cannot be attended to. All communications, whether the author's name is to appear or not, must be accompanied by the writer's name and address.

Members of the Society who do not receive the JOURNAL regularly, are requested to give immediate notice to the Secretary; and, in order to prevent mistakes, they are particularly requested to signify any change which they desire to have made in their address, with as little delay as possible.

"St. George."—A Notice on fixing Photographs will appear next week.

QUESTIONS FROM CORRESPONDENTS.

Brown Spots in Paper.—I am exceedingly desirous of discovering some means of removing the *brown spots*, or stains, by which many of my books—several of them amongst the most valuable—are disfigured. These stains are not produced "by damp or dew;" for though the illustrated editions of Rogers's "Italy" and "Poems" are injured by them throughout, there are other works (as the handsome Stuttgart edition, 1835, of "Schiller's Werke,") in which the plates alone are spotted, and the letter-press is untouched; and in the first edition of Cromeck's "Reliques of Burns," no part is stained except the appendix of "Poetry," which is evidently printed upon a different paper. It may be presumed, therefore, that the injury has been occasioned by something used in the bleaching or preparation of the paper; and if you can inform me of any application by which such spots can be removed, I shall esteem myself greatly obliged.—W. M. T. [No. 52.]

Waterproofing Canvass.—Can you tell me the best and simplest way to render Canvass or light Duck waterproof? A recipe of easy application would be of great use on many a small farm, for rich clothes are very dear.—F. S. A. [No. 53.]

Geology of North Staffordshire.—Can any of your readers favour me with the title of any work or pamphlet, which treats of the Geology of the North Staffordshire Coal and Iron-stone Field?—[No. 54.]

MISCELLANEA.

MUSEUM OF ORNAMENTAL ART, MARLBOROUGH HOUSE.—The numbers attending, &c., during the month of March were as follow: 12,037 persons on the public days and admitted free; 1,091 persons on the students days and admitted as students on the payment of 6d. each; besides the registered students of the classes and schools.

MOORE'S PATENT SPHERICAL, OR GREAT CIRCLE INDICATOR.—An instrument of considerable importance to Navigators was exhibited at Sir Roderick Murchison's Geographical *Soirée*, on Monday last. It is another and a great step towards simplifying that most troublesome, but most important problem of Great Circle routes. It consists of four graduated circles of eleven inches diameter; two of which, arranged in opposite planes, represent a meridian, and the equator, and over these two others by a most ingenious arrangement, are made to revolve in every direction, so that by two attached compasses, or graduated circles, every element of spherical trigonometry can be readily ascertained by inspection, to a great degree of accuracy; a process also adapted to those problems necessary in nautical astronomy. Without comparing it with other facilities for working spherical sailing, which have lately appeared, it will be an acceptable assistant to those who are now beginning to see the necessity of adopting every facility for the greatly increased range of commerce. It is believed that in a few years this system will again resume its place, which the projection invented by Mercator and Wright has quite kept out of view for so many years.

THE BOOMERANG PROPELLER.—On Tuesday afternoon a trial was made in the Mersey, at Liverpool, of Sir Thomas Mitchell's new mode of propelling ships by the boomerang, in lieu of the common screw. The boomerang is a crescent-shaped weapon, used by the natives of Australia; but, instead of an arc, it has an elbow in the middle. It is about two feet long and about two inches broad, a quarter of an inch thick, and is made of heavy wood. When thrown in the air by the natives, it describes two revolutions—one direct, and the other rotary. By the latter motion it revolves round its own centre of gravity, is enabled to survive the direct impetus with which it is sent up, and is made to screw back to the spot whence it was thrown. It appears that the difficulty of applying this invention lies in the fact that screw vessels are built with apertures too narrow for its application in its entire and complete form, as it requires a space equal to at least one-third of the height of the

aperture. In the present instance, the invention was applied in mutilated portions to the *Genova*, one of Messrs. M'Kean and M'Klarty's Mediterranean steamships—its freedom from choking at the centre, due to the convexity of one blade and the concavity of the other, being principally relied on. The reduction was so great, that whereas with ordinary steamers the boomerang would embrace two-thirds of the helix at once, the two blades of the one used in the *Genova* were not more than one-seventh each of the complete spiral, or less than one-third of the whole. The pitch was 23 feet 2 inches, the diameter 12 feet 3 inches, and the weight only 26 cwt.—making five feet less surface than the ordinary common screw, weighing 62 cwt. Notwithstanding these circumstances, the speed attained in slack water was from 9 knots to 9½ knots, under a pressure of steam of from 6 lbs. to 9 lbs. It is said that Messrs. M'Kean and M'Klarty are so satisfied with the result of the trial, that they intend applying the invention in its integrity to one of their ships.

FLAX IN IRELAND.—The monthly meeting of the Committee of the Royal Society, for the improvement of the growth of Flax, was held in Belfast, on 30th of March, Richard Niven, Esq., Chrome Hill, in the Chair. A sample of perennial flax was shown, which had been found growing wild in the county Cork. A letter was read from Mr. John Egan, Limerick, enclosing a sketch of a new scutching machine invented by him, which he stated to be capable of cleaning ten cwt. of fibre daily, with the labour of four persons. The Committee recommended him to have machine constructed, and promised to give it a fair trial in comparison with others. The machine invented by Mr. M'Bride was reported to be ready for trial at Belfast, and it was arranged that its merits should be fairly tested along with other new inventions of scutching machinery. Mr. De Cock, the society's Belgian instructor, had returned from a trip to Flanders, where he had contracted for three oil mills on the Flemish model, which would be erected by private individuals in Ireland. Attention was drawn to a new machine for cleaning and scutching tow, the invention of Messrs. Calvert and Garnett, of Cleckheaton, Yorkshire, a letter from whom was laid before the meeting, inclosing a specimen of the metal teeth used for the purpose. The machine consists of metal cylinders armed with these teeth, and it was stated to do its work much more perfectly than the implement termed a "devil," which is commonly employed for the purpose. It was further stated to be capable of cleaning thoroughly not only the ordinary scutch mill tow, but also that of the coarsest and dirtiest kind produced by the buffing socks, and to convert it into fibre worth 10*l.* to 12*l.* per ton. A great quantity of this sort of scutch mill refuse has been hitherto burnt, as it was found that no means previously adopted had been successful in cleaning out the fibres. Hence, if generally adopted in scutching districts, the new machine might prove of great advantage in enabling the waste to be turned to more profitable account.

NEW MATERIALS FROM WESTERN AFRICA.—We have been favoured by Mr. Thomas Clegg, of this town, with samples of two new materials for textile manufacture, which have been recently received from the southwest coast of Africa, and which, if they can be furnished in sufficient quantity, and at a moderate price, will probably become important articles of trade with that country. The first of these is a fibrous substance, sent by a missionary at Abbeokuta, as "red cotton." It is not produced in the neighbourhood of that place, but is brought thither from the Hoassa country to the northward, in considerable quantities; and the people who bring it state that the deep red colour which it bears is natural; but the writer of the letter adds, that the chief at Abbeokuta "thinks they lie." The scepticism of the chief is undoubtedly well founded. The material, which is not cotton at all, but an entirely new species of silk, is unquestionably dyed, probably with alkanet-root, which, we believe, is abundant in Africa. If sent in its natural state it will undoubtedly prove a very useful material for the waste silk spinners. The letter does not contain any information as to the price which this material bears in Africa; but as it is stated to be produced in great abundance, it seems probable that the price will be moderate. The other material to which we have referred is a new and somewhat peculiar description of wool, stated to be brought from Quitta, a town on the coast to

the westward of Abbeokuta; but as the climate of the coast must be very unfavourable for the production of wool, we think it is probably brought from some of the mountainous regions in the interior of the continent. Like the dyed silk, it was sent to this country as a sample of cotton, and with it was some yarn purporting to be spun from it. That, however, is unquestionably an error, as the yarn is made from cotton. The wool seems of tolerably fine quality, of a pale buff colour, apparently natural, and is worth, we are told, about 1*s. 3d.* per pound. If it can be found in quantity, it will prove a very acceptable boon to the woollen manufacturers of this country, whose supplies of raw material have latterly proved very insufficient.—*Manchester Guardian.*

PARLIAMENTARY REPORTS.

SESSIONAL PRINTED PAPERS.

Delivered on 19th, 21st, 22nd, 23rd, 26th, and 31st March, and 1st, 2nd, and 4th April, 1853.

Par. No.

- 141 (1). Occupiers (Ireland)—Summary of Return.
190. Duchy of Cornwall—Account.
205. Emigrant Ships—Copies of Reports.
215. Railways—Memorandum.
242. Committee of Selection—Fourth Report.
243. Norwich Election Petitions Withdrawal—Report.
191. Local Acts—Reports of the Admiralty.
121. Mails to Calcutta and Australia—Reports.
281. Sir James Brooke—Correspondence.
- 152 (1). Lancaster Borough Election—Index to Evidence.
210. Chatham Election—Minutes of Evidence.
216. Joint Stock Companies—Report.
221. Brewers, &c.—Account.
260. Barbadoes, &c.—Despatches.
- 151 (1). Canterbury Election—Index to Evidence.
214. Rolls and Records (Chester Castle)—Mr. Black's Report.
224. Clitheroe Election—Minutes of Evidence.
232. English Oak Timber (Navy)—Return.
251. Mercantile Marine—Circulars.
252. Chatham Borough—Return.
265. Russian Dutch—Account.
269. Immigrants and Liberated Africans—Return.
278. Public Debt—Account.
206. Canterbury Association—Correspondence.
230. Poor Relief (Ireland)—Return.
237. Common Lodging-house Act—Report of Capt. Hay.
250. Ramsgate Harbour—Report of Capt. Vetch.
- 250 (1). Ramsgate Harbour—Report of Mr. J. Walker (Reprint of No. 678 of 1851).
256. Rate in Aid (Ireland)—Account.
271. Dockyard Appointments—Correspondence.
272. Dockyard Promotions—Admiralty Order, &c.
212. Ecclesiastical Commission (Ireland)—Return.
236. Coal (London)—Return.
249. Mr. Robert Burns—Letter from Capt. Massie.
270. West India Mail Steamers—Return.
219. Derby Election—Minutes of Evidence.
233. Public Works Loan Commissioners—Account.
235. Hydrographical Survey—Return.
244. Houses—Return.
257. Consolidated Annuities (Ireland)—Account.
266. Eastern Archipelago—Copy of Despatches, &c.
279. New Churches—Thirty-second Annual Report.
243. Norwich Election Petitions Withdrawal—Report and Evidence.
234. Bills—Combination of Workmen.
239. "—Attorneys' and Solicitors' Certificate Duty (No. 2).
238. "—Copyholds.
240. "—Universities (Scotland).
241. "—Sheriff and Commissary Courts (Berwickshire).
245. "—Whinchurch Forest.
229. "—Absconding Debtors (Ireland).
247. "—New Forest Deer Removal (amended by Select Committee.)
282. "—Merchant Shipping.
248. "—Parish Constables (as amended by the Select Committee).
- Ecclesiastical Commission (England)—Fifth General Report; "Queen Victoria" Steamer—Report of Capt. Walker; Church Estates—Second General Report of Commissioners; Australia (Recent Discovery of Gold)—Further Papers; Law of Divorce—First Report of Commissioners; Burmah—Further Papers relating to Hospitals; Medical Charities (Ireland)—First Annual Report; Public General Acts—Cap. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15.
- Delivered on 5th April.
116. County Officers (Ireland)—Return.
227. Tavistock Election—Minutes of Evidence, &c.
274. Highland Roads and Bridges—Thirty-ninth Report of the Commissioners.

PATENT LAW AMENDMENT ACT, 1852.
APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

From Gazette, 1st April, 1853.

Dated 31st Jan.

264. C. Cattnach—Measuring human figure, and transferring same to cloth.

Dated 14th March.

633. Lord Howard de Walden—Cleansing sugar, by application of steam and hot air in a centrifugal machine. (A communication.)

639. J. Scott—Manufacture of animal charcoal.

641. W. Bashall—Improvements in dressing, sizing, and tape machines.

Dated 15th March.

643. T. J. Herapath—Treatment of sewage, and manufacture of manure.

645. F. Durand—Improved loom.

647. P. M. Parsons—Working valves of steam-engines.

Dated 16th March.

649. G. Knight and J. Heritage—Drying bricks and articles made of clay.

651. C. H. Wild—Fishes and fish-joints for rails.

653. H. R. Fanshawe—Fire-arms.

655. J. Oliver—Venetian red.

Dated 17th March.

657. J. Livesey—Pile and looped fabrics, and machinery for same.

659. W. Blinkthorn—Furnaces and annealing kilns for glass.

661. J. Roscoe and R. Bulloch—Apparatus for raising water.

662. J. Bottomey—Figured pile fabrics.

Dated 18th March.

663. R. Peters—Machine for mortising, &c.

664. J. A. A. and S. Tweedale—Spinning machinery.

665. P. Cameron—Marine and surveying compasses.

666. W. K. Westley—Improved comb for heckling, &c.

667. J. H. Johnson—Improvements in steam-engines. (A communication.)

668. M. Baxter—Improvements in steam-engines, and pressure regulating valves.

669. R. A. Broome—Machine for weighing or measuring and packing spices, &c. (A communication.)

670. A. E. L. Bellford—Power-looms. (A communication.)

671. J. Haskett—Grinding-stones and whet-stones. (A communication.)

673. C. Harratt—Strengthening masts.

674. R. O. Christian—Bed-hangers for emigrant ships, &c.

675. R. O. Christian—Ventilation.

676. A. W. Banks—Life-belts.

677. G. Ross—Lubricating oil, &c. (A communication.)

678. G. Mackay—Manufacture of iron. (A communication.)

679. R. B. Tennant—Machinery for pulping coffee.

Dated 19th March.

680. J. Eldridge—The rotary washing-machine.

681. J. Haley—Communication between guard and driver.

682. H. Bousquet—Manufacture of manure.

683. G. Dalton—Smelting iron ore, &c.

684. J. H. Johnson—Regulating steam-engines, and other prime movers. (A communication.)

685. S. Radcliffe and H. W. Whitehead—Machinery for setting surfaces of cylinders in carding-engines.

686. A. V. Newton—Oil lamp. (A communication.)

Dated 21st March.

687. J. Fraser—Manufacture of portable packages.

688. W. W. Collins—Looms. (A communication.)

689. T. Sykes—Treatment of soapy and greasy waters. (A communication.)

690. M. Poole—Generating steam.

691. J. M. Durnerin—Apparatus for extracting liquid out of solid substances, applicable to treatment of fatty matters.

692. M. Poole—Obtaining power where air is employed. (A communication.)

693. J. Taylor—Printing woven and other fabrics.

694. J. Barsham—Communication between guard and driver, and other persons in trains.

695. J. Bratt—Portable sketching apparatus.

696. J. Stather—Improvements in printing.

Dated 22nd March.

697. E. Maw—Connecting sheets of corrugated iron in construction of houses, &c.

699. T. Bouch—Improvements in signals.

700. J. H. Johnson—Smelting iron and other ores. (A communication.)

701. W. Johnson—Rolling and shaping metals. (A communication.)

702. N. G. Norcross—Machinery for planing.

703. F. Futvoye—Improved apparatus employed in games of chance.

704. H. H. Henson—Improvements in buffers.

WEEKLY LIST OF PATENTS SEALED.

Sealed 2nd April, 1853.

319. James Johnson, of Worsley, Lancashire—Improvements in heating, ventilating, and sewerage cottages or dwelling-houses.

359. Leon Godefroy, of Paris—Improvements in covering or packing rollers for printing fabrics.

362. William Tatham, of Rochdale—Invention of an improved mode or improved modes of preventing accidents on railways.

394. Robert Hawkins Nicholls, of Bedford—Invention for horse-hoeing land.

458. Peter Evans Donaldson, of Shrewsbury—Improvements in dams, locks, and lock-gates.

465. Joseph Cundy, of 21, Victoria-grove, Kensington—Improvements in hot-air stoves.

492. John Holmes, of Manchester—Improvements in lathes.

494. Philip Berry, of Manchester—Improvements in machinery or apparatus for manufacturing bolts, and nuts, and other similar articles in metal.

548. William Thorp, of Collyhurst, near Manchester—Improvements in steam-boxes, and the mode of heating press-plates used in hot-pressing of silks, de laines, cobourgs merinos, fancy goods, and other similar fabrics.

736. Somerville Dear, of Leeds—Improvements in the arrangement and apparatus of looms for weaving centre or other large patterns or designs in linen, cotton, silk, wool, or other fibrous materials.

1155. Joseph Burch, of Crag-hall, near Macclesfield—Improvements in machinery for reaping, loading, stacking, and storing grain, and other agricultural produce.

1156. Joseph Burch, of Crag-hall, near Macclesfield—Improvements in machinery applicable to thrashing, winnowing, cleaning, and sorting grain, and to other agricultural purposes.

1157. Joseph Burch, of Crag-hall, near Macclesfield—Improvements in passenger and other carriages.

60. Joseph Beattie, of Lawn-place, South Lambeth—Improvements for economising fuel in the generation and treating of steam.

368. Robert Davis Rea, of St. George's-road, Southwark—Improvements in bits.

Sealed 5th April.

227. Benjamin Mitchell, of Romsey, Hants—Improvements in the construction of artificial legs.

288. Augustus Waller, of Bonn, Rhine, Prussia—Improvements in the means of measuring or ascertaining the quantity of alcohol and other substances in brandy, wine, beer, and other liquids.

302. William Townley, of 2, Bartlett's-buildings, Holborn-hill—Invention of improved machinery or apparatus for watering and flushing streets, squares, courts, and other localities.

Sealed 6th April.

284. George Simpson, of Manchester—Improvements in machines or apparatus for weighing.

324. Thomas Restell, of the Strand—Improvements in chronometers, watches, and clocks, part of which improvements is applied to roasting-jacks.

329. Auguste Edward Lorâdoux Bellford, of 16, Castle-street, Holborn—Improvements in the construction of revolving or repeating fire-arms.

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

Date of Registration.	No. in the Register.	Title.	Proprietor's Name.	Address.
March 31	3438	Clapp's Hinged Mould and Cutter, for Casting Bullets or Balls, Solid or Hollow, Conical, Round, or any other shape	William John Clapp	8, St. James's-pl., St. James's, Exeter.
," ,	3439	Lever and Ferrule for Safety-valve	John Cawood and Joseph Sunter	Derby.
April 5	3440	Gold-digger's Dwelling	Job Skudder	Lower-road, Deptford.
	3441	The Elastic Abdominal Belt	Mrs. Thomas Groom	1, Sussex-terrace, Lorrimore-road, Walworth.
," 6	3442	The Registered Fast-handled Table-knife	Marsh, Brothers, & Co.	Sheffield.